

4. (Amended once) A system for sensing regions at and under a seafloor, comprising:

an array that includes a row of sonic transducers and at least one sonic detector;

5 a vehicle that supports said row at a height above the seafloor of no more than six meters and that can move said row along a path above said seafloor;

circuitry connected to said transducers to energize them one at a time to produced pulsed sonic beams, each pulse including a carrier frequency of at least about 200 MHz that is modulated.

5. (Amended once) The system described in claim 4 wherein:

said at least one sonic detector includes a row of sonic detectors extending parallel to said row of sonic transducers, with each sonic detector lying adjacent to a selected sonic transducer and between two of said transducers.

8. (Amended once) Apparatus for sensing characteristics of regions at and under a seafloor, comprising:

an array comprising a plurality of transducers that each can generate a sonic beam, and a plurality of sonic detectors that can detect sound;

5 circuitry connected to said plurality of transducers to energize them one at a time with an electrical pulse to generate a narrow sonic beam, said circuitry connected to said detectors to receive signals representing a sonic echo of each sonic beam;

said plurality of transducers being arranged in at least one row;

10 said sonic detectors include at least three detectors and said detectors are interspersed with said transducers, with each transducer associated with an adjacent sonic detector and with a plurality of detectors each lying between two of

said transducers.

14. (Not amended) Apparatus for sensing characteristics of regions at and under a seafloor, comprising:

an array comprising a plurality of transducers that each can generate a sonic beam, and a plurality of sonic detectors that can detect sound;

5           circuitry connected to said plurality of transducers to energize them one at a time with an electrical pulse to generate a narrow sonic beam, said circuitry connected to said detectors to receive signals representing a sonic echo of each sonic beam;

said plurality of transducers being arranged in at least one row;

10           said sonic detectors include at least three detectors and said detectors are interspersed with said transducers, with each transducer associated with an adjacent sonic detector;

15           said circuitry is constructed to energize said transducers with a carrier frequency of at least about 200 kHz, said transducers are spaced apart by at least about 3.5 cm and no more than 25 cm, and said at least three detectors include a detector lying adjacent to each transducer.

15. (New claim) Apparatus for sensing characteristics of regions at and under a seafloor, comprising:

an array comprising a plurality of transducers that each can generate a sonic beam, and at least one sonic detector that can detect sound;

5           circuitry connected to said plurality of transducers to energize them one at a time with an electrical pulse to generate a narrow sonic beam, said circuitry connected to said at least one detector to receive signals representing a sonic echo of each sonic beam;

said plurality of transducers being arranged in at least one row and each of said pulses has a carrier frequency of at least about 200 kHz and is modulated by a frequency less than said carrier frequency to generate a narrow sonic beam.

5 a vehicle that is constructed to tow said row of transducers along a path that lies an average of no more than six meters above the seafloor, with said transducers facing downward at the seafloor and with said row extending in a direction that is primarily particular to said path.

16. (New claim) Apparatus for sensing characteristics of regions at and under a seafloor, comprising:

an array comprising a plurality of transducers that each can generate a sonic beam, and at least one sonic detector that can detect sound;

5 circuitry connected to said plurality of transducers to energize them one at a time with an electrical pulse to generate a narrow sonic beam, said circuitry connected to said at least one detector to receive signals representing a sonic echo of each sonic beam;

10 said plurality of transducers being arranged in at least one row and each of said pulses has a carrier frequency of at least about 200 kHz, and is modulated by a frequency less than said carrier frequency to generate a narrow sonic beam.

said at least one sonic detector includes at least three detector which are interspersed with said transducers, and with a plurality of said detectors each lying between two of said transducers.